REMARKS

Claims 18-27, 29-33, 35-57, 65, and 69 are pending in the Application and are rejected under 35 U.S.C. §103(a) based upon the references of Matsuura, et al., U.S. Patent No. 7,136,684 and Varma, et al., U.S. Patent Application Publication No. US2004/0213419.

Rejections Under 35 U.S.C. §103(a)

The pending claims are rejected as being rendered obvious by the combination of Matsuura, et al. in view of Varma, et al. Matsuura, et al. was an earlier cited reference, and the claims were amended during prosecution to further define the invention, and arguments were presented pointing out how the Matsuura, et al. reference does not teach the features of the invention.

In the current Office Action, the Examiner argues that it is inherent within the Matsuura, et al. reference that the sampled representations processed by the headset would include user speech as opposed to extraneous noise. However, such a feature is not inherent because the headset would process both user speech and extraneous noise together. It does not care about content. Matsuura, et al. transmits the audio signal when the user is speaking, but does not make any determination with respect to the content of that audio signal, and whether that audio signal has speech words in its content, or is just noise.

Specifically, the Matsuura, et al. reference discloses a headset and recording system for recording the utterances of a wearer, such as a doctor, for example. The system captures the utterances of a user wearing a headset and transmits them, such as for two-way radio communication, and then records those utterances in a memory unit. Matsuura, et al. does not care about the content of the utterance or whether it is speech. It could be simple mumbling or laughter by the user, and the Matsuura, et al. headset would still transmit the captured audio. Whatever sound is captured by the Matsuura, et al. headset and the microphone is transmitted automatically, and is recorded for future processing and use. The recorded audio may then be replayed and reviewed.

All noises and audio signals captured by the Matsuura, et al. microphone are transmitted to be recorded. As noted in Column 12, Lines 1-5, and again in Column 16, Lines 1-10, communication contents, such as those spoken into a headset are automatically stored in the memory unit, and thus, are automatically transmitted from the headset to the memory unit. That is, as noted in Column 16, while recordings of audio captured by the headset may be selectively turned on and off, the present invention presupposes that, when the headset is worn and the communications are started, the communication contents, such as

conversation contents, are automatically recorded. In any case, the audio signals are always transmitted by the headset, regardless of their speech content.

Therefore, all the sounds captured by the Matsuura, et al. headset are generally transmitted and may or may not be recorded. Whatever audio is captured, that audio will be processed and sent utilizing a radio communication module. But Matsuura, et al. teaches no way to know the actual content of the captured audio and whether it is speech or unintelligible noise.

The Examiner refers to the Varma, et al. reference in order to somehow teach that the sampled representation includes user speech as opposed to extraneous noise. However, Varma, et al. is directed to a noise reduction system for voice applications directed to gaming consoles. The combination of Matsuura, et al. and Varma, et al. certainly would not provide the teaching to a person of ordinary skill in the art to render the present invention as obvious.

Specifically, the claims of the invention have been further amended to clarify their scope. Specifically, although Claims 18-28 are cancelled, Claim 29 has been amended to further recite a system for wireless communications using speech recognition. In speech recognition, as discussed in the current Application, various steps of processing take place in order to determine the actual speech content of an audio signal that may contain user speech or spoken words. The

content, for example, would be specific words that are spoken and then recognized by the speech recognition for various purposes. To that end, there is some initial processing of the audio signals in that headset, referred to as front-end speech recognition that occurs prior to the additional speech recognition processing that might occur in the other device. The additional processing might include, for example, further code book lookup steps and/or pattern matching in order to determine what actual words are spoken. This later processing is referred to in the present Application as back-end speech recognition speech processing.

The present invention provides a system for wireless communication using speech recognition. Referring to Claim 29, that system includes a device that is configured for processing speech signals using speech recognition circuitry wherein the device includes at least some back-end speech recognition processing circuitry. As claimed, the system of Claim 29 further comprises a headset configured for performing front-end speech recognition processing by initially forming sampled spectral transforms of the captured audio signal, and processing those sampled spectral transforms using speech detection circuitry to determine that the captured audio signals include user speech as opposed to extraneous noise.

Therefore, the headset recited in Claim 29 performs a specific speech recognition process in order to determine whether there are actual spoken words or speech within the audio signals captured by the

microphone in the headset such that they should be further processed using back-end speech recognition. Furthermore, the invention processes the captured audio into a form (sampled spectral transforms) that then might be utilized for more efficient back-end speech processing. If the headset determines, through the front-end speech recognition processing, that the content of the captured audio signals include user speech as opposed to some extraneous noise, then it will transmit the signals for the back-end speech processing. If the headset determines, by the front-end speech recognition processing, that the captured audio is simply noise, rather than actual user speech words, the headset does not allow for the transmission of the sampled spectral transforms to the device for further processing. If the front-end speech recognition processing of the sampled spectral transforms does determine that the captured audio signals include user speech as opposed to the extraneous noise, the headset has switching circuitry that facilitates wirelessly transmitting the sample spectral transforms to the device for use of those spectral transforms to complete the speech recognition of the system.

Again, as noted above, the elements called forth by the Examiner in Matsuura, et al. simply refer to a microphone and an element called a speech detection unit 36 and encoding hardware 38. In the Matsuura, et al. reference, the speech detection unit 36 is only disclosed as converting the speech signal generating by the microphone into a digital

signal. It does not provide any front-end speech recognition processing, and does not form sampled spectral transforms of the captured audio signals in order to process those sampled spectral transforms to determine that the audio signals include user speech as opposed to extraneous noise. The speech detection unit 36 of Matsuura, et al. merely converts the captured audio signals into digital signals. Those digital signals are transmitted unconditionally when spoken, and there is no analysis or processing of those audio signals to form sampled spectral transforms. Nor is there any analysis or processing of those sampled spectral transforms. Rather, everything captured by microphone 17 is transmitted by circuit 36. Such indiscriminate transmission utterly defeats one of the purposes of the present invention, which is to selectively forward signals only when they include spoken words, as determined by the speech recognition processing.

The Matsuura, et al. reference is primarily directed to recording audio signals. As earlier pointed out, in Column 8, Lines 1-10 of the Matsuura, et al. reference, the system presupposes the basic constant recording where the recording is made automatically while the user wears the headset and carries out communications. There is simply no teaching of the selective features of the invention, including a headset with switching circuitry, that is operable to facilitate selectively wirelessly transmitting the sampled spectral transforms of the captured audio

signals when user speech is detected from those spectral transforms, but not allowing transmitting to the device when user speech is not detected from those spectral transforms.

Nor does the Varma, et al. reference make up for the lack of teaching in Matsuura, et al. such that a combination of those two references would render obvious the present invention. Varma, et al. is referred to by the Examiner for teaching a device and the use of a sampled representation, which includes user speech as opposed to extraneous noise. Essentially, the Varma, et al. reference is directed to a noise reduction system for a gaming device. However, the present invention is not directed to noise reduction. In fact, if the captured audio in the headset of the invention is analyzed using the front-end speech recognition processing and found to contain speech or spoken words, that audio would be transmitted even if it did contain noise, because it also contains the desired speech. The invention is looking for recognized speech, even if that speech has noise in it. It just does not transmit noise alone without speech. Matsuura, et al. will always transmit when there is a sound, regardless if that sound is spoken words or not. The Varma, et al. reference provides no teaching with respect to speech recognition. Rather, it teaches a noise reduction system that has an array of microphones that are used to recognize noise from known locations and to filter that noise from the known locations so that any voice communications is free from the undesirable noise.

It is unlikely that a person of ordinary skill in the art would even refer to the Varma, et al. reference to somehow modify the Matsuura, et al. reference. Even if those two references were combined, all that would be achieved is to provide some noise reduction in the headset of Matsuura, et al. Such a combination still would not teach a system as recited in Claim 29 that provides wireless communications using speech recognition, wherein a device is configured for using speech recognition circuitry that includes at least some back-end speech recognition processing circuitry, and a headset captures audio signals and performs front-end speech recognition processing by initially forming sampled spectral transforms and processing those sampled spectral transforms to determine if the captured audio signal includes user speech. Nor is there a teaching of a headset that includes switching circuitry to selectively transmit the sample spectral transforms for further completion of the speech recognition by back-end speech recognition processing circuitry, only when the captured audio signals include user speech, as determined by the front-end recognition processing of the spectral transforms.

Therefore, a combination of Matsuura, et al. and Varma, et al. does not teach all the limitations recited in Claim 29. Thus, that claim cannot be rendered obvious under 35 U.S.C. §103(a). Accordingly, Claim 29 is allowable. Dependent Claims 31-33, 39-41, and 43-44 each

depend from Claim 29 and thus, would be allowable for similar reasons. Furthermore, each of those claims recites a unique combination of elements, which is not taught by the cited art.

Claim 45 is directed to a method for wireless communication between a headset and a device using speech recognition. Claim 45 further recites the step of processing the captured audio signals, and performing front-end speech recognition by forming sampled spectral transforms of the captured audio signals. Claim 45 further recites using speech detection circuitry to analyze the sampled spectral transforms to determine that the captured audio signals include user speech as opposed to extraneous noise. Furthermore, Claim 45 recites using switch circuitry for selectively wirelessly transmitting sampled spectral transforms of the captured audio signals when user speech, rather than noise, is detected from those spectral transforms, but not transmitting when user speech is not detected. Claim 45 also recites that the device, using back-end speech recognition processing circuitry to process the spectral transforms that are transmitted by the headset to complete the speech recognition. For the reasons discussed hereinabove, the method as recited in Claim 45 also would not be taught by the two prior art references of Matsuura, et al. and Varma, et al. such that those references would render obvious Claim 45. Accordingly, Claim 45 is allowable. Claims 48-49, 51-52, and 54-57 each depend from Claim 45,

and thus, would be allowable as well. Furthermore, each of those claims recites a unique method or process, including a combination of steps, which is not taught by the cited prior art.

Claim 58 has been amended and recites headsets for communication with a remote device for use in speech recognition. The headset is recited as comprising front-end speech recognition circuitry that forms sampled spectral transforms of the captured audio signals in order to reduce the amount of microphone system output data that is communicated. Claim 58 further recites switching circuitry coupled with the front-end speech recognition circuitry and configured to facilitate selectively transmitting the sampled spectral transforms when user speech is detected, and not transmitting when user speech is not detected. Claim 58 further recites that the sampled spectral transforms are in a form usable by back-end speech recognition processing to complete the speech recognition. For the reasons discussed hereinabove with respect to Claim 29, Claim 58 is also in an allowable form, and is not rendered obvious by the cited combination of prior art references. Each of Claims 65 and 69 depend from Claim 58, and would be allowable for the same reason. Furthermore, those claims recite a unique combination of elements, which are not rendered obvious by the prior art.

In light of the foregoing, it is respectfully submitted that the present application is in a condition for allowance and notice to that effect is hereby requested. If it is found that the present amendment does not place the application in a condition for allowance, Applicant's undersigned attorney requests that the examiner initiate a telephone interview to expedite prosecution of the application.

Applicants are submitting the fee due for the two-month extension of time with this response. If any additional fees are necessary, the Commissioner may consider this to be a request for such and charge any necessary fees to deposit account 23-3000.

Respectfully submitted,

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Document #790546